

AMPOULES FOR PRODUCING A REACTION GAS AND SYSTEMS FOR  
DEPOSITING MATERIALS ONTO MICROFEATURE WORKPIECES IN  
REACTION CHAMBERS

ABSTRACT OF THE DISCLOSURE

Ampoules for producing a reaction gas and systems for depositing materials onto microfeature workpieces in reaction chambers are disclosed herein. In one embodiment, an ampoule includes a vessel having an interior volume configured to receive a precursor with a headspace above the precursor. The ampoule further includes a carrier gas inlet for flowing carrier gas into the vessel, a conduit having an opening in the precursor and an outlet in the headspace, and a means for flowing precursor through the conduit and into the headspace to increase the surface area of the precursor exposed to the carrier gas.